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PROFESSOR WHITEHEAD'S "PERCEPTUAL OBJECT"

A PHILOSOPHY of nature must be based upon the facts of sense perception whatever their ultimate analysis may be. This much every one would admit. Professor Whitehead has indeed gone so far as to say "Nature is that which we observe in perception through the senses," and although as an account of what is meant by "Nature" the statement is inadequate and to that extent misleading, it does at least emphasize an important truth, namely, that a philosophy of nature necessarily involves an analysis of perceptual occurrences. Such statements as "I hear the bell," "I see the chair," are descriptive of experiences that do in fact occur, and which, moreover, are to be distinguished from experiences expressed by such statements as "I hear a sound," "I see a patch of color." To admit the distinction is not to accept any given philosophical analysis. Everyone, whether he be philosopher or scientist, or plain man, must admit that the statement "I hear a bell" is sometimes true and that it is to be distinguished in some respect that is important from the statement "I hear a sound." It is safe to say that no philosophy of nature that fails to entail a given analysis of these occurrences can be adequate or true.

Professor Whitehead's philosophy of nature is one of the most important and interesting of recent attempts to investigate "the coherence of the known." He has given considerable attention to the analysis of perceptual occurrences, and certainly his theory of the nature of perceptual objects is an integral part of his philosophy.[1] It is worth while to enquire as to the way in which Professor Whitehead would account for the contrast expressed by such statements as "I hear a bell" and "I hear a sound." It is clearly not sufficient to say that in the first statement the object referred to is a *perceptual object;* whereas in the second statement the object referred to is a *sense-object;* we need further to know how the perceptual object is related to the sense-object, and what precisely is the difference in the two occurrences described by the two different phrases "hearing a bell" and "hearing a sound."

[1] Professor Whitehead's theory of objects is expounded in *The Concept of Nature,* Ch. VII, and in the *Enquiry Concerning the Principles of Natural Knowledge,* art. 15, art. 22–26, and Part IV. Henceforth these books will be referred to respectively as *C. N.* and *P. N. K.*

It must be admitted that Professor Whitehead has so far left the relation between the perceptual object and the sense-object in some obscurity, and this obscurity has not been lessened by a recent note as to a change in his views about the perceptual object.[2] I propose to consider briefly the contrast between his earlier and his later view and to enquire what, according to his latest theory, must be the relation of the sense-object to the perceptual object.

Comparison of *The Principles of Natural Knowledge* with his later writings reveals that Professor Whitehead has, from the first, been in some hesitation with regard to the nature of the perceptual object. That he is now aware of his hesitation is shown by the addition, to the second edition of *The Principles,* of the note to which reference has already been made. The *Aristotelian Address* on "Uniformity and Contingency" and the *James-Scott Lecture* on "Relatedness," both given in 1922, mark this change, though Professor Whitehead does not here indicate any disagreement with his previous view and he may have been then unaware of a fundamental alteration in his conception of the perceptual object. Clearly, however, in these two lectures Professor Whitehead puts forward a view of the perceptual object, which not only does not refer to the original account of it as a group of sense-objects, but which would certainly be embarrassed by reference to such a view. It is impossible to reconcile these two accounts and it is to be regretted that Professor Whitehead did not expressly repudiate the former when he propounded the latter.

In order to be clear as to the exact nature of the problem involved in the relation between the two types of object, it is desirable to see how Professor Whitehead first conceived their relation, and how the subsequent development of his philosophy of nature led him to an incompatible view. For the sake of brevity I shall henceforth speak of these two views as View I and View II. View I is stated in *The Principles of Natural Knowledge* (1st ed., 1918), and is almost unmodified in *The Concept of Nature* (1920). View II is indicated in the paper on "Uniformity and Contingency" and in Chapters II and IV of *The Principle of Relativity.* That there is a difference between the two views is stated for the first time in the second edition of *The Principles* (1925).

The sense-object is a term in an irreducible multiple relation involving the percipient event as one of the terms; hence the sense-object is logically dependent upon the percipient event and is thus not capable of being a quality of its situation; it may, moreover, have many situations at once. A sense-object involves, then, all sorts

[2] *P. N. K.*, 2d edition, p. 204.

of events in all sorts of ways. This account of the sense-object has not varied.

According to View I the perceptual object is a group of sense-objects; and, since it is said to be the common sense "thing," *e.g.*, a bell, a chair, it is also that which more than one perceiver perceives. The sense-object is thus to be contrasted with the perceptual object as in some way "private" or peculiar to a given percipient; whereas the perceptual object is "public" or common to many percipients.[3] The problem arises: How can the latter be a group of the former? How does what was "private" and a term in an irreducible multiple relation become "public" and cease to be multiple by becoming a group?

According to View II the perceptual object is a "pervasive adjective" of its situation. An adjective is said to "pervade" an event when it is "an adjective of any temporal slice of that event." Thus a perceptual object is here said to be related to its situation in the two-termed way of *adjective qualifying substantive.* In this respect it is again to be contrasted with the sense-object which can not be a "true adjective of its situation" since it logically involves dependence upon the percipient event.[4] It may be described as a pseudo-adjective in so far as it appears to be an adjective of its situation to a given percipient event who ignores himself. But the pseudo-adjective is no more an adjective than the quack is a physician. There is a fundamental difference between them. A set of pseudo-adjectives can not become an adjective by being combined into a set.

It is to be noted that in View II the perceptual object is no longer defined in terms of the sense-object. Gradually, so it seems, Professor Whitehead has come to the conclusion that the perceptual object can not be a collection or class of sense-objects; it is in some sense more fundamental than the sense-object. It is instructive to find some indication of the latter view even in View I. After having defined the perceptual object as "a group of associations of sense-objects" Professor Whitehead proceeds to qualify the definition by adding "But the object is more than the logical group; it is the recognizable permanent character of its various situations."[5] In View II this "more" has developed into the "control" theory of perceptual objects. The multiplicity of the ingression of sense-objects into nature must in some way be "controlled" if sense-objects are to be referred to a given perceptual object. It can not be doubted that sense-objects are sometimes so referred, although it may

[3] The words "private" and "public" are not used by Professor Whitehead, but they indicate a contrast which he seems to make.

[4] *The Principle of Relativity*, p. 33.

[5] *P. N. K.*, art. 24.6.

be admitted that there are "stray smells, sounds, colors and more subtle nameless sense-objects" which do not involve the perception of perceptual objects and are thus unreferred to a unique situation.[6] On the other hand, the perception of a thing is always accompanied by awareness of sense-objects. This is a plain fact of experience. We are able to speak of "the brown color of that chair" and the statement has significance. We may say that the perceptual object is exhibited in the sense-objects which are referred to it as being sense-objects *of* the given thing. Thus Professor Whitehead says, "The modes of ingression of sense-objects in nature are the outcome of perceptual objects exhibiting themselves. The grass exhibits itself as green, the bell exhibits itself as tolling, the sugar as tasting, the stone as touchable."[7]

According to View II, then, the perceptual object is to be regarded as being somehow the condition of the ingression of sense-objects into nature; the perceptual object is said to be "a permanent factor conditioning adjectives of appearance."[8] Again, it is said that "the ultimate character of perceptual objects is that they are Aristotelian pervasive adjectives which are the controls of ingression.[9] The sense-objects, therefore, signify the perceptual object; but, although the perceptual object can be known only in so far as it is exhibited in sense-objects, yet, not only can we not—in accordance with View I—define the perceptual objects in terms of the sense-objects, but we are forced to admit that the former is the permanent factor which conditions the appearance of the latter.

View II, then, says that the perceptual object is both a pervasive adjective and a control. What is the relation between being an adjective of a situation and being a control of ingression? Are they the same? It would, I think, be true to say that the perceptual object is a control of ingression just because it is a pervasive adjective, a permanent conditioning factor. But we must enquire *how* a pervasive adjective controls and in what way a permanent factor conditions adjectives of appearance. What is the justification for saying that the situation of the perceptual object is unique or continuous whilst the situations of the sense-object are various? The justification must be found in a quite fundamental difference between sense-object and perceptual object as regards their ingression into nature.

Such an attempted justification must start from the fact of sense-perception. What Professor Whitehead calls the "perceptual ob-

[6] See *C. N.*, p. 156.

[7] See *Uniformity and Contingency*, p. 17.

[8] *Principle of Relativity*, p. 73.

[9] *Uniformity and Contingency*, p. 17.

ject" is the common sense thing. This "is" is not an *is of identity;* we are not merely using two names having the same application; in calling the common sense thing a "perceptual object" we are suggesting a definite analysis of its nature. It is to be regretted that Professor Whitehead's identification of the perceptual object with chairs, tables, stones, trees, *etc.*, has been stated by him with so little qualification.[10] It can scarcely be denied that the common sense "table" is much too crude to be a perceptual object. What common sense means by "the table" is something which there is no reason to suppose is contained in the universe; belief in such entities is a relic of the persistence of those substance-philosophies which Professor Whitehead has done so much to undermine. The common-sense notion of a table, a bell, a rose, is of a continuous, persistent substratum of qualities, capable of momentary existence, though not capable of being at a point. Such a conception is a product of pre-relativity physics and is dependent *for its meaning* upon the traditional separation of space and time. Whitehead's recognition of *events* as the "ultimate substances in nature" introduces a fundamental difference between his view and any common-sense notion of material objects. This is perhaps obvious, but it is a fact that is frequently forgotten.

It is important to observe that the common-sense notion of a material thing, such as a table, is definite only in so far as visual and tactual sensa are concerned. The plain man says "the bell rings" or even, "there is the sound of the bell"; but he does not commonly regard the sound—a specific note—as a quality of the bell, but as an effect that the bell produces and which he is capable of perceiving through a sense-organ. The plain man would not be reluctant to admit, if he were questioned, that the sound proceeding from the bell is a determinable effect having different determinate values (*viz.*, different specific notes) at different positions from the source of the sound, which "source" he would tend to identify with "the bell." It is a commonplace that the transmissive side of nature is more easily recognized in the case of sound than in the case of color. Hence the plain man would be prepared to admit that when I "hear the bell" from *here* the sound *is where* I am. But the colored, hard, metal "bell" is said to be *there* at some distance from me, and moreover at a precise distance that can be *measured*, the end points of the measurement being determined by contact. Once, however, it has been recognized that light, no less than sound, has to travel with a finite, though great, velocity, that consequently the color that I see has left the bell a finite, though incredibly small, fraction of a second before I see it, doubt may arise as to whether the color is *there*, where I am said to locate it, in quite the simple way that the plain man

[10] *P. N. K.*, art. 24.1.

would suppose. The plain man's distinction between color and sound in this respect is easily explicable, the two most important factors in the explanation being the immense difference in the relative velocities of light and of sound and in the much greater commonness of more or less temporary defects in our hearing than in our visual apprehension of colors. The fact that the defect is temporary makes the plain man more aware of the part played by his own sense-organ in the relation of "being the sound of the bell." Once these two factors are recognized it becomes insistently obvious that there is very little to be said for any philosophy that is predominantly "common sense."

It must be noted, however, that I do "really see" the color to be, say, six feet away from me, and I do not "really hear" the sound to be at a distance, although the hearing may be accompanied by an implicit judgment of the distance of the source. This fact, the apparent distance of the color, is not here relevant, for we are emphasizing at this point only the significance for the theory of perception of the admitted fact that light is transmitted at a finite velocity. The further importance of apparent distance must be considered later.[11]

It seems, then, that if by "the bell" we mean to indicate something having all the qualities revealed to sight, hearing, and touch when we are said to "perceive the bell," then "the place where the bell is"—*i.e.*, the situation of the bell—must be much less determinate than the plain man supposes.

What I perceive, *viz.*, the bell with all its visual, audible, and tactual characteristics, is what Professor Whitehead calls a perceptual object. When I say "that is a bell" I intend to refer to a perceptual object which is something more than, and is in important respects different from, any sense-object named by the "that" which is the direct object of my visual, or auditory, sense-awareness. Nor is the difference to be found merely in an accumulation of sense-objects. That the perceptual object is such an accumulation of sense-objects is the theory of View I; but this has been plainly superseded by View II. Nevertheless, View I contains an important element of truth which must be admitted into View II. This is the recognition of the fact that there is no apprehension of perceptual objects save by the way of sense-objects. I see the bell because I see a sense-object of sight in a certain situation. Thus stated, it becomes evident that there is a further problem, *viz.*, to relate the sense-object, notwithstanding its various situations, to the one situation of the perceptual object. In View I this relation was conceived as being merely membership of a group, a relation which in fact did the work it was supposed to do, but only at the expense of raising

[11] See below p. 203.

an insoluble problem with regard to the alleged neutrality of the perceptual object. It is under the pressure of this latter problem that the theory of the perceptual object as a set of sense-objects breaks down and is replaced by the control theory.

At this point of the discussion it is important to keep in mind two conditions that must be met by any satisfactory theory of the nature of the perceptual object: (1) it must be possible to refer *some* sense-objects to a given perceptual object such that we may be able to say "The *same* perceptual object is perceived under various conditions"; (2) the perceptual object *of* which they are sense-objects is to be referred to a unique situation.

Before we ask whether these conditions can be satisfied, we must pause to consider the significance for this problem of the variations in the apparent size, shape, and color of a perceptual object such as a bell, or a penny. It has already been pointed out that we can be said to perceive the colored bell at a certain distance, and we say "the bell *is* where it is *seen* to be." This distance may be called the *apparent distance*. It is to be noted that every visual sense-object, and therefore every perceptual object perceived by sight, is seen to be at a distance; it is the characteristic of vision that there is not perceived contact between the visual sense-organ and the object seen. Now apparent distance is determined by apparent size. Since experience is necessary before we can perceive apparent size, it follows that experience is necessary before we can perceive apparent distance. This fact is of great importance. Had I had no previous acquaintance with sense-objects I should not *see* this table *at a given distance* because it would have no apparent size. The apparent size of a table is a sense-object; it is something that can be recognized and is ingredient in certain events. One sense-object can convey another with which it has been associated in previous acquaintance; apparent distance is conveyed by apparent size. It should be clear that "apparent" is not here opposed to "real," but to "causal." What we sometimes call the "real size" of the penny is one of its apparent sizes. The "real size" is also a sense-object. It is important to insist upon the fact that the *real* size of the penny is a certain one of its apparent sizes distinguished, for easily assignable reasons, from other very similar apparent sizes. So, too, with its apparent shapes; for shape is also a sense-object. There is no difference in the type of entity involved when a penny is apprehended as being "really circular" and "really of such and such a size" and when it is being apprehended as "apparently elliptical" and "apparently of such and such an other size" when it is looked at out of the normal. In both cases what is being apprehended is a visual sense-object; an object is what it appears to be, and in this sense of the word "apparent" it

"really has" apparent characteristics that are to be distinguished from causal characteristics.[12] The distinction between "causal character" and "apparent character" is, for the present purpose at least, a more important distinction than the familiar distinction between "reality" and "appearance"; it may well be that the ground of the latter distinction is to be found in the former. It is clear, then, that even if the "real" size and shape of the penny were fundamentally different from any of the other sizes and shapes that it may "appear" to have under various conditions, yet this real size would be an apparent character in the sense in which the word "apparent" is here being used.[13]

Size and shape, then, *as perceived* are recognized characters, *i.e.*, objects. Space, however, is derivative from the fundamental relation of "extends over" which holds between events; and events are fundamentally different from objects. It follows, therefore, that perceived shape is not strictly spatial. When we perceive shapes and sizes, or a more or less determinate shape of a more or less determinate size, we are perceiving not a relation between events, but *objects*. Hence, shape and size are only derivatively spatial by reason of their ingredience in events. An apparent perceived size is ingredient in an event that extends over the events in which a lesser apparent perceived size is ingredient. There is a further distinction to be made, *viz.*, between shape as an object, *i.e.*, perceivable shape, and geometrical shape, *i.e.*, shapes which have the characteristics specified in geometrical definitions.[14] These two "shapes" are of fundamentally different kinds, the one being a recognizable character, the other a non-perceivable entity.[15] A geometrical circle, for instance, is a figure derived from certain relations between events; as such it is not the kind of entity that could be recognized; it could not be colored, and so on. There is, of course, an intimate connection between the circular perceivable shape, an object, and the geometrical circle, since the latter is a relation between events and the former, being an object, is ingredient in events. Nevertheless, the two must not be confused. Only if the distinction be borne in mind will it be found possible to account for the variations in size and shape of the "same thing." It is obvious that a given sense-object can not be both circular and elliptical, or of different sizes, for a sense-object is

[12] See *P. N. K.*, art. 60.

[13] I should myself maintain that there is no such fundamental difference.

[14] "Geometrical shape," in the sense in which I am here using the term, must not be confused with the "geometrical figures" of which Whitehead speaks in *P. N. K.*, art. 63.1.

[15] It has often been said that no existent circle is a "perfect circle." In accordance with the distinction just made we could restate this: "No apparent perceivable circular shape is a geometrical circle."

exactly what it appears to be; nor is it possible for a geometrical circle to be elliptical, nor for a geometrical ellipse of a given eccentricity to have also some other eccentricity. To suppose otherwise can be seen to involve contradiction. But it does not follow from this that a given perceptual object can not control sense-objects of different shapes and sizes, nor will the perceptual object be itself a geometrical shape.[16] It is important to observe that in the case of size there is no distinction corresponding to that between geometrical shape and shape as an object; there is no geometrical size; in other words, size in *only* an object.

Now, since a perceptual object is a control of ingression determining the ingression of sense-objects into nature, a given perceptual object controls all those apparent characters which are terms in the relation "being a sense-object for a given set of percipient events." Variations in the shape and size of the "same penny" are changes of the sense-objects that the penny exhibits. Since "being a sense-object" is an irreducibly multiple relation change in one term may be followed by change in other terms; hence, alteration in the distance, the medium, the percipient may involve alteration in the sense-object.

The perceptual object seems now to be lost in the multiplicity of the sense-objects, and it might seem as though all that were left is to identify it with a set of sense-objects, following the lead of Mr. Russell, who identifies "the thing" with the class of its appearances.[17] Such an identification would do all that is required to "explain" the variations in shape, size, color, and so on, of what we call "the same thing," *e.g.*, the penny. This explanation would, however, involve a reversion to View I; but we have already seen that View I breaks down under the necessity of recognizing the adjectival nature of the perceptual object and its consequent neutrality as between different percipients. We were thus driven to conceive of the perceptual object as a control of the ingression of sense-objects into nature, not as a group of any kind. That is to say, that for the relation, assigned in View I, of "membership of a group" View II substitutes the relation "being controlled by." View I marks the first remove from a theory suggested by reflection upon the facts of sense-perception, *viz.*, the intimate interrelation between "a thing" (perceptual object) and its "appearances" (sense-objects) and the

[16] The difficulties that arise from subjective variations in estimating an interval of clock time can be similarly dealt with. A lapse of time that is *recognized* as similar to, or different from, a given lapse of time, is, as such, an object. Further difficulties may arise from the fact that psychical process is itself passing. These difficulties concern the relation of mind to nature and can not be dealt with here.

[17] See *"Our Knowledge of the External World,"* p. 106.

incompatibility of the variations of those appearances among themselves.

It has already been pointed out that the common sense thing has determinate boundaries only so far as its color and its shape, throughout a small duration, are concerned. It is to be noted that this determinateness is apparent only, being due to the necessities of practice. A sock continues to be the *same* sock so long as it can be worn to cover the same foot.[18] We have seen also that the attribution of color to the place and shape in which we see it located depends upon our neglect of the fact that light is transmitted. If we intend to mean by the perceptual object what common sense means by a material thing, we should have to say that the material thing has nothing like the sharpness of contour or the determinateness of characteristics that is at first supposed. We want "Cleopatra's Needle" to be the *same* object before, during, and after a London fog.[19] But the fulfillment of this demand takes us away from the apparent simplicity of the object. Chairs, pokers, and socks are, as Professor Whitehead has said, "infected with an incurable vagueness." It is in the insistence upon this point that a philosophy of nature must take its first important departure from common sense; it is soon found to be a departure from which there is no return to a simple-minded view of the nature of material objects. It might be supposed that changes due to lapse of time must be recognized as an essential characteristic of the present Cleopatra's Needle, and that, with this addition, we can say "It is the same object." But once we recognize the significance of the time element the common-sense belief in permanent yet conceivably instantaneous things is upset, for the recognition carries with it the denial of the view that Cleopatra's Needle, a penny, or a piece of iron, can *be* at an instant.[20] This denial is, as suggested above, a necessary consequence of the substitution of space-time for space and time, a substitution that plays havoc with common-sense theories. To say, as Whitehead does, that the perceptual object is the common sense thing is, as we have seen, to some extent misleading, for the common sense "thing" is a product of sense-awareness and unrecognized metaphysical prejudices that have no secure basis in fact; the "perceptual object" is what remains when the prejudices and inconsistencies have been cleared away in the light of fuller knowledge. The vagueness of perceptual objects is no bar to their practical value; on the contrary, were perceptual objects not vague they could not serve the purposes of common sense. But for the scientist the position is quite other-

[18] See *P. N. K.*, art. 24.9.
[19] See *C. N.*, p. 171.
[20] See *P. N. K.*, art. 5.4.

wise; the vagueness is felt as "incurable," *i.e.*, as a defect that would be the better for a remedy. But the defect *is* incurable, and the "remedy" consists in substituting another object for the perceptual object. This is the physical object, which, under pressure of the need for exactness in thought which, as Whitehead has pointed out, demands simplicity of the logical relations involved—gives way to the final substitution of the scientific object. It is not necessary to repeat here Professor Whitehead's account of how the exactness can be secured by using the "principle of convergence to simplicity by diminution of extent."[21] What must be noted is that subsequently to Professor Whitehead's first account of View II he has been led to make a distinction between the perceptual object and the physical object, and thus to depart again from common sense which sees no need for such a multiplication of entities. The physical object is, Professor Whitehead says, "halfway towards a perceptual object"; it is the apparent character of the causal character of the scientific objects of which it is composed, and is itself the causal character of the apparent character of perceptual objects. This account of the relation of the various types of objects involves the rejection of any fundamental distinction between causal and apparent character. It would not be too much to say that Professor Whitehead's whole philosophy of nature depends upon this rejection, and consequently demands a new theory of causation.[22] To deal with this problem fully would be to write a long chapter on *Causation*. Here it must be sufficient to remark that the notion of cause has arisen from the attempt to make more precise the interrelations of what is perceived. Causal characters emerge in the attempt to define apparent characters. The relation of the various types of objects to each other can not be separated from a discussion of causal characters. This intimate connection of thing and cause is at once a difficulty and a merit in Whitehead's theory. It is a difficulty because it makes the determination of "this thing" excessively complicated; it is a merit because only if the excessive complication be first admitted can any plausible account of the "same thing" and of its interrelations with other "things" be given. The assumption that there are determinate common sense things, such as water, clothes, sun, earth, falling bodies, and so on, and a causal relation between them, has led to insuperable difficulties such as the problem of transeunt causation, action at a distance, and others of the same kind. Is there an activity in the cause which produces the effect? Is there a passing over of an influ-

[21] *C. N.*, p. 82; p. 171.

[22] See *P. N. K.*, 2d edition, p. 204. "The separation between the apparent and the causal must not be over stressed; it is relative to a deliberately limited point of view." *Cf.* the present writer in *Proc. Arist. Society*, N. S., 25, p. 314.

ence from cause to effect? These questions have been constantly asked, and much ingenuity has been spent in their discussion. It is significant that such problems have bulked largest in the predominantly common sense theories of English philosophers. They are problems that arise from a too hasty initial acceptance of common sense views, and a too great readiness to interrogate the plain man. It may be felt that most of these questions are now admitted by all to belong to an old-fashioned point of view. But the point of view has not been wholly abandoned, and Whitehead's subsumption of *causation, situation, predication,* under the one head of "ingression" is felt by many people to be ridiculous. It is just this method of approach, however, that seems likely to lead to a more fruitful treatment of the problems of causation.

Whitehead first puts causation in its proper place as a special variety of a relation that includes the relation of situation, of influencing and of ingression in the narrower sense.[23] There is no simple and ultimate distinction between cause and situation; a thing is not *there* and its effect *here,* nor *then* and its effect *now;* the "thing" is where its "effects" are. It is the mistake—common to Hume and to the plain man—of supposing that there are *things* that are "distinct existences" which have somehow or other to be brought into miraculous connection or to remain for ever in unknowable isolation that Whitehead's theory rejects. Causal character is dependent upon a given point of view. When "*X* causes *Y*" there is a relation of causal character in *X* to apparent character in *Y;* but the apparent character of *Y* is the causal character of an apparent character in *Z,* and so on.[24] This conception of causation will be found to lift the notion out of the mystery in which it has usually been left.

It is, however, not only the notion of "a thing" that must be overhauled; if the *thing* can not be in isolation, neither can its *qualities.* Professor Whitehead's theory of objects involves the rejection of the category of quality in the sense that it involves the denial of its ultimateness.

"To be red" is a multiple relation; *red* is a sense-object which is a term in a multiple relation. Hence, the proposition "This is red," which grammatically ascribes an adjective to a substantive, must be analyzed into a relational proposition of a form such as "There is a *red* sense-object from a given place through a given medium to a given percipient event." So, too, with all simple qualities such as colors, sounds, tastes, and so on. "To be qualified" is a multiple

[23] *C. N.,* p. 146.

[24] This statement needs much development, but it is not possible to attempt it in this place.

relation. It follows that if *anything* were alone in the universe it could not have a quality, it could not be red, or resonant. Certainly everyone would have to admit this, but its consequences are not always observed. A quality is that which can be recognized; it is an object. To say "This has the quality x" is to say "This is recognizable as x." But x is a term in a multiple relation. Hence, "quality" must be analyzed into *sameness* and *relatedness*. The relation will be a multiple relation in which *sameness* is a term itself involving a relation. It follows that it is logically impossible for a simple quality to characterize one thing only. This appears paradoxical. But the paradox vanishes when we consider the nature of the "one thing" that is to be characterized. Anything that can be the logical subject of a proposition is a substance; on Whitehead's theory only events are substances; objects are their qualities. But there is no event which does not extend over other events; hence any event in which, for example, red is ingredient extends over other events which are also the situations of *red*. Hence, no simple quality characterizes one event only; it is recognizable because it is permanent amid the passing of events; and the logical counterpart of permanence is sameness.

Every philosophy that makes *Substance-Quality* fundamental; every philosophy that attempts to resolve the universe into a *Substance-qualified-by-adjectives* has to deny the reality of temporal process. The notion of *quality* is the notion of a characteristic at an instant. Such a notion is indispensable in science, but it is an ideal, not a fact. Whitehead's insistence that "the ideal of nature at an instant is the ideal of a nonentity" is necessitated by his rejection of the ultimateness of quality and in turn necessitates the rejection of it. If quality is not ultimate, it follows that subject-predicate propositions are not logically fundamental. This is so. A subject-predicate proposition, *e.g.*, "This is red," must be analyzed into a relational proposition and a proposition ascribing the relational proposition to a subject. At this point it may be objected that Professor Whitehead has asserted that perceptual objects are Aristotelian adjectives of their situations. This is true, and the statement certainly requires examination in view of the rejection of quality as ultimate.

The Aristotelian adjective is a quality predicated of its subject in such a way that no reference to anything beyond it is involved. On this view, "This is red" is a proposition that can be understood without reference to anything but "This" and "red," and is such that it would not be meaningless were there nothing in the universe but a momentary "This" and a momentary "red." But, as we have seen, on Whitehead's view this is not the case. Nevertheless,

a perceptual object, *e.g.*, a bell, is said to be related to its situation in a simple two-termed way. "A perceptual object," says Professor Whitehead, "is a true Aristotelian adjective of its situation."[25] On the face of it there is a difficulty here. In order to make the nature of the difficulty clearer it is advisable to restate the characteristics which we conceive to belong to the Aristotelian adjective. It is such that (i) it could be understood in isolation from everything else, *i.e.*, it is logically possible for it alone to be; (ii) it could qualify a substantive at a moment, *i.e.*, it does not essentially involve a reference to process. These are the characteristics, then, that must belong to a perceptual object if it is to be an Aristotelian adjective of its situation. They *can* belong to it only in so far as the perceptual object is abstracted from the concrete whole in which it is embedded. But, as Professor Whitehead has insisted, things are more or less abstracted; atomicity, the characteristic of adjectives, is "a property capable of more or less complete realization."[26] The perceptual object regarded as in some sense absolute, that is, as not essentially involving reference to anything beyond itself, has the character of atomicity. Moreover, Professor Whitehead points out, "we can discriminate in the four-dimensional continuum certain regions or events, such that each exhibits a physical character which is entirely independent of the physical characters of other events or of the other physical characters of that event."[27] This atomicity, characteristic both of the perceptual object and of the scientific object, involves absoluteness and continuity. Both result from abstraction from the "inexhaustible relatedness among inexhaustible relata." The perceptual object is an abstraction made under the impulsion of practical interests narrowly confined to the present, short duration. In accordance with the principle of convergence to simplicity with diminution of extent the perceptual object is regarded as being situated in a very small duration within which it has uniqueness and continuity of situation, the uniqueness being due to the object, the continuity to the overlapping of the events with which it is associated. Now it is just the continuity of the situation that makes the perceptual object both a pervasive adjective and a control of the ingression of sense-objects into nature. Since the adjective attaches to every stretch of the route which it pervades—its situation—there is a "fusion of the continued sameness of the adjective with the concrete individuality of the historical route"; hence, the present

[25] *Uniformity and Contingency*, p. 15.

[26] *Principle of Relativity*, p. 72.

[27] *Principle of Relativity*, p. 72. *Cf.* "In modern scientific phraseology, a perceptual object means a present focus and a field of force streaming out into the future."

is a control of the future, and it is a control just because it is adjectivally qualified. Moreover, the present has also duration and the perceptual object is observed throughout the duration of the specious present. We can now answer the question raised at the outset as to the relation between "being an adjective of the situation" and "being a control."[28] It is because the perceptual object is an adjective related to every stretch of the historical route which is its situation that it is a control. Those sense-objects that are referred to a given perceptual object are so referred because the perceptual object is known by its relatedness and the sense-object signifies the relatedness. It is impossible that there should be a perceptual object that is not signified at one and the same moment—or, more precisely, to one and the same percipient event—by more than one sense-object; it is the reference of two or more sense-objects to the same situation by virtue of their relation to the same perceptual object that is meant by the statement that the perceptual objects exhibit themselves in sense-objects; the perceptual object exhibits; the sense-objects signify. But while the sense-objects signify by virtue of their relation to the perceptual object, the perceptual object is signified apart from its relatedness; it is signified as an adjective.

The notion that a perceptual object, a chair, is an adjective is certainly shocking to common sense and to many philosophers. It must, however, be remembered that an Aristotelian adjective is a *universale in re,* and we must beware of making nonsense of Whitehead's theory by the simple method of reading into it a theory of universals that he would repudiate. At the same time it must be admitted, and indeed insisted upon, that Whitehead's theory does involve a denial of the ultimateness of the distinction between *brownness* and *chairs;* both are abstracted from a more concrete whole. But while only philosophers would think of attributing being *per se* to *brownness,* many philosophers are in agreement with the plain man in requiring a chair to be of such a nature that it might exist alone in a solitary universe, if not with *all* its properties (conveniently called "secondary" and thus disposed of by the physicist), still at least with enough of them to be still a substantial entity, an essential "chair." It is the merit and the novelty of Professor Whitehead's line of argument that he has shown that the one demand is as absurd as the other. On this point philosophers might well learn a lesson from Locke.[29] "Universals" such as *brownness* are

[28] See p. 199 above.

[29] *Essay,* Bk. IV, C. VI, 11. "This is certain, things, however absolute and entire they seem in themselves, are but retainers to other parts of nature for that which they are most taken notice of by us. Their observable qualities, actions, and powers are owing to something without them; and there is not so

not different in kind from *chairs;* they are only more abstracted. In abstracting the "universal" the necessary relatedness of object to object must not be ignored, nor their essential ingression in events. *Brownness* is timeless and non-spatial only in the sense in which a *chair* is timeless and non-spatial; both alike are in time and space only in virtue of their relations to events.[30]

The habit, encouraged by language, of "over-universalizing" the "universal" has been responsible for an objection that is sometimes brought against Whitehead's theory of the object. It may be supposed that since, for example, the Great Pyramid is an object that as such can not recur, there could not be an exact replica that was not identical with that of which it was a replica, which would be absurd. Certainly it is logically possible that there should be such a reduplication, and how, it may be asked, is this possible on Whitehead's theory? The answer is to be found in the degree of abstraction involved. Were there an exactly similar "Great Pyramid" ingredient in another region of space-time, there would be *two* "Great Pyramids." If it be objected: "Then the 'Great Pyramid' is not a 'universal'?," the reply is that it differs from what is ordinarily called a "universal"—such as brownness or similarity—only in the degree of its abstractness. This view may, of course, be rejected as a whole, but it is futile to criticize the theory of objects in terms of a theory of universals that it is intended to replace. Criticism must be preceded by some agreement as to what exactly a "universal" is. Professor Whitehead has not denied that there may be objects known to intellect, but not to sense-awareness. Thus he says, "relations between objects and relations between relations may be factors in nature not disclosed in sense-awareness, but known by logical inference as necessarily in being. Thus objects for our knowledge may be merely logical abstractions . . . an object is often known merely as an abstract relation not directly posited in sense-awareness although it is there in nature." [31]

Perceptual objects, then, are not substantives to be contrasted with qualities, such as *brownness,* as universals; these are not fundamentally different kinds of entities. There are two fundamentally different kinds of entities, *viz.,* events and objects; but whilst events may be regarded as the "ultimate substances in nature" objects as such must not be simply identified with what is usually called a "universal" which is one only among the various types of objects.

Finally, it is to be noted that, although Professor Whitehead's

complete and perfect a part that we know of nature, which does not owe the being it has, and the excellences of it, to its neighbors."

[30] *Cf.* Article by the present writer in *Proceedings of the Aristotelian Society,* N. S., XXV, p. 320.

[31] *C. N.,* p. 126.

theory rejects the assumption that there is a fundamental antithesis between subject and predicate as ordinarily understood, as, for instance, in the proposition "The chair is brown," nevertheless, it requires a distinction between events and objects that has much in common with the distinction between particulars and universals. There is still an essential duality; but the nature of the terms and of their relations is conceived to be very different from what has been commonly supposed. In the opinion of the present writer the restatement of the problem has freed Professor Whitehead's theory from the difficulties that arise from what has been recently called "that great muddle, the theory of universals." [32]

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INTELLIGENCE AND MORALS [1]

TO raise the question of the basis of law and morals is in itself sufficiently academic and old-fashioned to allay any suspicions that this paper, since it is devoted to the thesis that law and morals have no rational foundation, is subversive in its purport. I am attempting to revive an issue which might well be dead, because I think it is generally assumed that a rational basis for morals has been found, and the problem is solved, whereas the real reason for abandoning it might be the discovery that morality needs no rational basis.

The theory which seems quite generally to have gained the day is the utilitarian, using that term in its broadest sense, the theory which bases law and morals on their social utility. It is a commonplace, at least among those who claim to have a scientific and practical interest in these matters, that a rational morality is equivalent to social intelligence. Persons who speak casually of "social ethics" (and who does not?) seem to take it for granted, vaguely perhaps, that the tradition represented by Hobbes, Hume, and the nineteenth-century utilitarians, to mention only its most outstanding figures, is substantially true on this point.

Let me call your attention, therefore, to Hobbes' account of the Law of Nature, as a classic exposition of this theory. According to him the moral law is that body of means which can be proved to be generally necessary for gaining given social ends. Morality is, to use his words, "the conformity of manners to reason." (*Leviathan*, I., Ch. 15). "The sum of virtue is to be sociable with them

[32] F. P. Ramsey, *Mind*, N. S., p. 417.

[1] Read at the meeting of the Eastern Division of the American Philosophical Association, Northampton, December, 1925.

that will be sociable, and formidable to them that will not" (*De Corpore Politico,* I., Ch. IV). And since to be formidable leads to war, and war to the defeat of that "peaceable, sociable and comfortable living" which men naturally desire, reason bids us renounce the law of "honor" and follow the law of "sociability," which is the law of "equity and justice." More specifically, he attempts to prove that any rational being who has sociable *ends,* must assent to the following necessary *means*: (1) seek peace, (2) make covenants, (3) keep covenants made, (4) show gratitude, (5) accommodate himself to others, *etc.*—nineteen "laws of nature," or more accurately, nineteen "theorems" of morality. The analogy is obviously to the mathematical sciences, which were at the time in their philosophic glory.

We are not now inquiring whether or not Hobbes' list is correct and whether or not he successfully demonstrated his theorems from his premises; we are interested in the general structure or method which he gave to moral philosophy. And I take it for granted that as far as this ideal pattern or method of ethics is concerned, the other utilitarians and the great majority of so-called social scientists of today would support his claim that this "is the true and only moral philosophy." The aim of this theory is to discover and demonstrate the general principles of conduct or law which are necessary to attain the given ends of social life. If a man should not agree to the ends, of course these principles do not apply to him, but if a man admit the ends and then refuse to follow the necessary general means, he is convicted not merely of immorality, but also of stupidity.

It is this thesis which I wish to discuss, and let me put it first in its negative form: Can a "sociable" man be immoral without being stupid? We are not concerned, let me repeat, with the man whose *ends* conflict with hose of his associates, nor are we concerned with an irrational morality. Granted that we have discovered *the* necessary general means to a given social end, is a man stupid who disregards them in attempting to gain the end? The answer seems almost self-evident. Hobbes says, of course such a man is a fool.

"The fool hath said in his heart, there is no such thing as justice; . . . seriously alleging, that every man's conservation, and contentment, being committed to his own care, there could be no reason, why every man might not do what he thought conduced thereunto: and therefore also to make, or not make; keep, or not keep covenants, was not against reason, when it conduced to one's benefit. He does not therein deny, that there be covenants; and that they are sometimes broken, sometimes kept; and that such breach of them

may be called injustice, and the observance of them justice: but he questioneth, whether injustice, taking away the fear of God, for the same fool hath said in his heart there is no God, may not sometimes stand with that reason, which dictateth to every man his own good; and particularly then, when it conduceth to such a benefit, as shall put a man in a condition, to neglect not only the dispraise, and revilings, but also the power of other men. The kingdom of God is gotten by violence. . . . From such reasoning as this, successful wickedness hath obtained the name of virtue: and some that in all other things have disallowed the violation of faith; yet have allowed it, when it is for the getting of a kingdom" (*Leviathan* I., Ch. 15).

Suppose we let Machiavelli speak for the "fool." The idea that life must be lived according to rule in order to be lived well, impresses him as extremely bookish and pedantic. Social life is an art, not a science, and all these universal means are a fabrication, not an actuality. Actual reason is concerned with particulars. Each man in each particular situation must survey his purposes and his materials and then make the best of them. Intelligence is a function of individual deliberation, not a system of general theorems. Any attempt to find universal means, even admitting certain general ends, is apt merely to lead into the ridiculous position of those who sanction the end in general, but disapprove of the means in particular. The practical circumstances are too much subject to the whims of Dame Fortune to permit of formulation into universal theorems. There are, of course, certain generalizations and practical maxims, the fruit of mature experience or wide historical reading, which have a limited usefulness in the instruction of novitiates, but these are far from universal, and in general merely emphasize the need of individual judgment. The common habit, however, of resorting to moral laws, is a fact, and the moral beliefs which control men must be understood and reckoned with. But they merely complicate an already complicated affair. Morality is merely one of the many facts which a wise man must take into account and use as he can. But if he subject himself to a moral system, he will soon discover that even the most carefully reasoned rules have a very limited utility. It is no doubt difficult to lead life without principle, but he who can do it is certainly no fool.

Of these two theories, Hobbes' and Machiavelli's which I may be permitted to call the *utilitarian* and the *pragmatic*, it seems to me the former gives a true account of morality, and the latter of intelligence. Hobbes was not justified in assuming that his analysis of morality was also an adequate analysis of intelligence, and Machiavelli would not have been justified if he had erected his

analysis of intelligence into a moral philosophy. Morality and intelligence are distinct in essence, and not to be confused in practice.

Let me construct a concrete case. I suppose that if one desired to formulate the necessary rules which make public libraries possible, one could easily prove the reasonableness of most of the rules which are actually in operation. In any case, let us suppose we have formulated rational library rules. Along comes a man who agrees that libraries are a fine institution and who would not do anything which might undermine them. He discovers that a certain book in the library would probably not be missed if he took it for a year or two in violation of the rules, and that even if it were, it would not affect general library procedure, being a very exceptional case, inasmuch as the vast majority of the patrons obey the rules. In short, he carefully calculates that no evil consequences will result from his theft, and we will suppose that his calculations turn out to be correct. His act of theft, I suppose, might be admitted to be immoral, but, by definition, it is not stupid. Our reason for calling it immoral would probably be that of Hobbes—it violates a general rule, or custom on which the existence of libraries depends. His action is contrary to the necessary universal means to his own ends. Hobbes calls this not merely immorality, but also stupidity. But how can this man be called stupid? He knows the rules; he knows his conduct violates them; he knows that if the rule were destroyed libraries would be impossible. But the point is that his action has not undermined the rule. The morality of others is unshaken, and diagnosing this situation correctly, he is able to exploit their morality in order to achieve his ends, without endangering the common end. If the act were generalized, it would be stupid, but it is not generalized.

No doubt this illustration will be said to state the exception that proves the rule. It is only because library morality is practically universal, that library immorality is not necessarily stupid. But let me postpone that question a moment. I have taken this obvious case purposely. Here is at least *one* man whose conduct is intelligent and immoral. I am not now interested in the possible number of such men. One man will illustrate the distinction. The essence of his immorality seems to lie in his making himself an exception to a rule of which he approves in general. This implies Hobbes' conception of morality, and I see nothing wrong with it. Of course, Hobbes' enthusiasm for the universality of mathematical science is misleading; but it is pardonable and does not invalidate the important point. The universality of moral rules is, of course, relative; it is not mathematical, but social universality. A moral rule or cus-

tom is universal in the sense that it controls all the members of a social group which has devised it for attaining the ends of that group. Moral rules are as relative and variegated as the social groups which they control. But within any one group, the moral man does not merely agree to the ends which his group serves, but adopts those general means which alone give the group practical force. Whether these laws, customs, or general modes of procedure are formulated or not, he acts as he expects other members of the group to act. By virtue of his membership in a group he is not a special case, but an instance of a universal. He does not ask for exceptional privileges because he does not want to be excepted. A political group or state is merely a particular instance of this moral order. A law is a general means believed to be necessary to the accomplishment of the ends of the state, and a citizen, in so far as he regards himself as a member of the state and in sympathy with it, agrees to the laws which govern it. The willingness to be governed by laws, is but an instance of morality. Law and morality thus imply social universals, customs, or group norms. This is the fundamental truth in the utilitarian theory and the element of truth in the Kantian categorical imperative.

But the utilitarian theory, while giving a substantially correct account of the nature of morality, over-reached itself when it pretended to be also an account of reason in general. The utilitarians' conception of reason was itself built on moral lines. Having discovered that morality operates by universals, these moralists conceived reason on the same pattern; and in this the mathematical sciences with which they were preoccupied encouraged them. For the scientists, dominated by the Cartesian and Newtonian physics, found the anarchy of the so-called "state of nature" less natural as well as less rational than the artificial state of society or law. But it is a far cry from this legal Reason to intelligence as it is actually practiced and as Machiavelli consistently expounded it. Actual reasonableness does not imply morality. That morality may and should be responsive to intelligence, and that intelligence may itself be a moral obligation, are, I suppose, not to be disputed. But that intelligence is possible only by means of laws and customs is not so evident.

It is certainly *a priori* possible that an end may be achieved not merely by the only possible general means, but by any number of particular expedients. Libraries might conceivably remain as useful as ever, in spite of the fact that a large number of readers were using their own devices. In fact, there is considerable evidence that libraries do actually operate extensively in spite of rules. Nor need

this fact invalidate the moralist's claim that the given library rules are the only possible *general* rules.

It is also empirically quite possible that the most important of our social institutions are much more Machiavellian in their actual operation than the official rules and laws might lead us to think. Even though my library illustration may appear to prove the moral rule rather than the exception, there are many institutions which are obviously not as dependent on general rules as are libraries. Ever since the days of Thrasymachus it has been a commonplace among moralists that the wicked thrive. And probably some of this thrift is due to intelligence. I am not now speaking of those wicked who thrive at the expense of the just, but of those who are more successful than the just in attaining the social ends which they have in common. "One prince of the present time," says Machiavelli, "never preaches anything else but peace and good faith, and to both he is most hostile, and either, if he had kept it, would have deprived him of reputation and kingdom many a time" (*Prince,* Ch. XVIII). A few moments' conversation with any practical politician might incline one to think that this prince is a fairly accurate symbol of the social order of to-day. In the light of such facts, therefore, it would seem to be at least a large assumption to maintain that intelligence is identical with morality, and that society must be based on any set of laws whatsoever. The neat structure, based on dialectic models, which the moralist assigns to human society is at best an over-simplification. In a radical analysis of intelligence, morality is, if not irrelevant, merely one among many particular social devices for particular purposes. In this mixture of principles and policy, of customs and casuistry, of law and expediency, it is quite gratuitous to claim for the just a monopoly of intelligence.

On the other hand, the fool who says there is no justice, is certainly a fool. Justice may not be indispensable, and the kingdom of heaven may from time to time be attained by violence, but it is also attained by justice. The modern immoralist, who in his enthusiasm for secular intelligence, preaches the doom of morality, is the logical antithesis of the over-zealous utilitarian with his proof for the reasonableness of morality. He is in a sense a neo-puritan, railing at the innocent enjoyments of those "all too human" beings who submit to a moral order. As if there were not room both in heaven and on earth for a number of independent modes of life! Machiavelli was at least consistent. He did not preach a new morality with new virtues and duties; he merely gave practical advice to those who would listen and said nothing about morals. To erect the art of the immoralist into a moral philosophy or even into

a new religion merely confuses matters. Even were it consistent the denunciation of all morality is as academic and illiberal as the traditional defenses of morality. Apologies for and tirades against morality or religion are perhaps more frequent but no less gratuitous than those directed toward industry, science, poetry, love, or music. These are all natural arts of human life, and each is its own defense.

Morality, therefore, like music, has an immediate basis in human nature and deserves to be stated in its own terms as much as intelligence does. In this sense, Kant made a more profound analysis than the utilitarians; for, though he failed to see what they saw, namely, that the universals of morality are social, not dialectical, he unequivocally asserted that morality is itself an ultimate quality of human behavior, and not derived from the understanding. It is unnecessary to call man's willingness to abide by the customs or laws of a group an innate trait of human nature, for its gradual development in any given individual can be explained empirically. But it is certainly superficial on the part of the utilitarians to attribute this trait to man's intelligence. It is much too uncalculating. It grows along with intelligence, but not out of it. Men become moral in the same way they become musical, and for no better reason. This ultimacy of moral categories was, of course, overdone by Kant and even more by his romantic successors, who tried to make morality more ultimate than intelligence. This exaggeration is a natural reaction to the exaggerated prominence which the utilitarians gave to reason. Both positions are equally fallacious, but the Kantian emphasis was at least a needed antidote to the utilitarian rationalists. Morality and intelligence are two of the various primary arts, and each has its own basis in human nature, however much they may coöperate in their functions. A more general recognition of this distinction might liberate both. On the one hand, we might become more willing to accept morality as one of the natural goods of the soul, and, on the other, we might pursue intelligence in a more secular and realistic spirit.

However, the recognition of this distinction is but the beginning of wisdom. Did any soul persistently follow only a single art, its career would be comparatively simple. But just as our political states are "mixed," so also is any individual. Few reasonable men are completely moralized, and few are radically lawless. A man frequently does without regret what he would not even attempt to justify. Thrasymachus and Socrates neither convince nor refute each other. The one describes social facts and jeers at the "drivelling" moralist, the other refuses to look at facts and concentrates on the "natural good of the soul." But most of us are part Thrasy-

machus, part Socrates, and hence we are alternately convinced by each. Morality and intelligence are like the two steeds of the soul in Plato's fable; they have each their own principle, but a skillful driver may nevertheless make a team of them.

But when on occasion these two principles lead in different directions we are driven into impasses. The conflicts arising from the dual allegiance to intelligence and morality are more serious and baffling than those problems which arise within either field. They are the materials of great tragedy. What reader of Aeschylus or Euripides has not devised a simple and intelligent solution? But what reader, who could feel the force of the morals involved, has not discovered the helplessness of intelligence here? Here man is put to the supreme test. Here the philosopher is more baffled than the fool. When these most difficult and seemingly inexorable problems arise, and when their import is fully realized, the attempt at solutions usually yields to the overpowering sense of human limitations. Like Andromache amid the ruins of Troy, a wise man may here resort to prayer, and find in it at least a temporary refuge from the hand of fate. But I make no pretense to wisdom, nor do I have any light to throw on such crucial dilemmas in the art of living. I merely suggest that the distinction I have been defending solves fewer problems than it raises. But it may at least have the negative use of indicating that the love of wisdom is something even more difficult and much less academic than our current theories of morality and intelligence suggest.

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BOOK REVIEWS

The Philosophical Presuppositions of Mathematical Logic. HAROLD R. SMART. (Cornell Studies in Philosophy, No. 17.) New York: Longmans, Green & Co. 1925. 98 pp.

This monograph presents a critical study of the issues between "modern" logic, with its repudiation of meager abstractions and formalism, and the "new" mathematical logic, in which formal abstraction is carried to its highest pitch. An adequate discussion of these issues would require a good-sized book. But interest in the subject does not, perhaps, warrant such extended treatment. So that while one must note the inadequacy of this study to its title, one need not therefore criticize. Within its limits of length Professor Smart has suggested some of the questions which are really vital.

However, he has not always separated what is essential from what

is accidental. Here appears the consequence of another explicable limitation. In discussing the philosophical position which accords with some special discipline, two methods are possible: one may study the subject historically and externally, taking as its implications those which its devotees have generally insisted upon; or one may put oneself within the discipline and discover what is characteristic or necessary by an independent examination. For one whose attitude is unsympathetic, the first method is generally to be recommended as more objective; and it is this method which Professor Smart has mainly followed. But it suffers from the obvious liability to confuse what is merely historical with what is unavoidable. For instance, Professor Smart comments at length on the preoccupation of mathematical logic with extension, and points out, very shrewdly, some of the difficulties of the exclusively extensional point of view. As a fact, this preoccupation has marked the main development of mathematical logic from Boole to *Principia Mathematica;* and some mathematical logicians—notably Mr. Russell—have come near to insisting on its necessity. But this is not essential: the existence of MacColl's work and of Strict Implication go to prove it. Indeed, one may plausibly argue that the possibility of formal or abstract truth depends upon the existence of truth which can be known with certainty in advance of particular instances, and that such truth can only be stated as the implications of concepts, *i.e.,* in intension. Thus one would say that not a single proposition in mathematics can be correctly interpreted as a proposition in extension, precisely because mathematics is formal and abstract. So that while Professor Smart's criticisms have their significance as against a certain historical development, or an interpretation of it by its authors, it is questionable whether they are pertinent to the "presuppositions of mathematical logic."

Finally, while one may sympathize with much of Professor Smart's criticism and appreciate to the full the thinness of any highly abstract procedure, and the desirability always of bringing it back into contact with the concrete and putting it to work, one can not pass the fact that, in his conclusions, his critical enthusiasm has run away with him. When he says that "A review, inclusive alike of the historical background and of the most ambitious forms of mathematical logic, is hardly more than a record of complete failure," he will be credited only by those who are completely ignorant of what was attempted, for instance, in *Principia Mathematica* and the degree of its achievement. If he should say that this sort of thing is not worth doing, the statement might be arguable; when he says that it fails, he condemns himself more than the subject.

The reason, or *a* reason, for this attitude seems to concern a ques-

tion about what logistic attempts and its method of procedure. In commenting (p. 94) on the fact that it is characteristic of the subject to select and define in ways which are logically arbitrary, he points out (quite correctly) that such selection is ordinarily dictated by some external consideration of interest or importance. Frequently such interest represents some concrete exemplification of the selected type of order. For instance, we study abstract Euclidean geometry, rather than some non-Euclidean system, because of its supposed application to space and not at all because of any strictly logical quality of it. And we are interested in delimiting certain logical relations of classes, as against others, because they comprise the logical relations of cardinal numbers. Professor Smart characterizes the presence of such extra-logical criteria in determining what logical orders are selected for development or study as "surreptitious introduction" of presuppositions. It is hardly surreptitious: students of the subject have supposed it obvious that a knowledge quite apart from logic is necessary to discover what types of abstract order have concrete exemplifications, and are therefore specially interesting. And such knowledge is not "presupposition" in the sense of "necessary condition" because the logistic method of developing any abstract system in no wise depends on any question of possible applications: that is the peculiar significance of abstract mathematics—that it needs no empirical premises.

Perhaps there is a further issue here—the question whether any formal knowledge is truly separable from empirical sources or elements—on which the "new" logicians and the "modern" logicians would very likely divide. Professor Smart does not discuss this difficult question, except by implication.

In any case, this monograph will have much value if it serves—as it is capable of serving—to call attention to certain oppositions between the new formal logic, with its "linear" inference, and the modern "epistemological" logic. A rapprochement and a better understanding on both sides are needed.

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Harvard University.

JOURNALS AND NEW BOOKS

Zeitschrift für Psychologie. Bd. 99, Heft 1 u. 2. Bemerkungen zu W. Köhlers Artikel "Komplextheorie und Gestalttheorie": *G. E. Müller.* Die Erblichkeit der Musikalität: *H. Koch* u. *F. Mjöen.* Komplex und Begriff I: *J. Petzoldt.* Ueber die kleinsten vibratorisch wahrnehmbaren Schwingungen: *D. Katz* u. *F. Noldt.*

JOURNAL OF EDUCATIONAL PSYCHOLOGY. Vol. XVII, No. 3. First Steps Toward a Scale for Measuring Attitudes: *M. A. May* and *H. Hartshorne.* A Personal Constant: *H. Heinis.* A Test for Art Appreciation: *T. F. Karwoski* and *E. O. Christensen.* Age, Sex and the Interrelations of Mental Attainments of College Students: *J. W. Gowen* and *M. Gooch.*

Choisnard, Paul: Entretiens sur la Sociologie. Paris: Ernest Leroux. 1926. 130 pp. 10 fr.

Ingarden, Roman: Über die Stellung der Erkenntnistheorie im System der Philosophie. Halle: Max Niemeyer. 1926. 36 pp. 7.50 g.m.

Janet, Charles: Constitution Orthobiontique des Êtres Vivants. I: Theorie orthobiontique. Beauvais: H. Dumontier. 1925. 84 pp.

Konig, Josef: Der Begriff der Intuition. Halle: Max Niemeyer. 1926. 420 pp. 16 g.m.

Kottje, Friedrich: Erkenntnis und Wirklichkeit. Untersuchungen über die Metaphysischen grundlagen der Organischen und Anorganischen Natur. (Beihefte zu den Annalen der Philosophie un Philosophischen Kritik, 2.) Leipzig: Felix Meiner. 1926. viii + 185 pp. 6 R.M. (Develops on a Bergsonian foundation a vitalistic interpretation of the evolution of matter.)

Troland, Leonard T.: The Mystery of Mind. (Library of Modern Sciences, edited by E. S. Slosson.) New York: D. Van Nostrand Co. 1926. xi + 253 pp. $3.00.

Utitz, E., editor. Jahrbuch der Charakterologie. Vols. II and III. Berlin: Rolf Heise. 1926. 482 pp. u. 27 Tafeln. 16 R.M. (Contains articles by Hans Prinzhorn, Richard Müller-Freienfels, Hans Kern, Ludwig Klages, Ludwig Marcuse, Paul Plant, Franziska Baumgarten, Robert Gaupp, Alexander Lipschütz, Franz Brentano, Willy Andreas, Oskar Kraus, Hans Schneickert, Robert Heindl.)

Waldstein, Louis: The Subconscious Self. Its Relation to Education and Health. New Edition, with the Preface to the German Edition by Dr. Otto Veraguth and a Biographical Sketch by Sir Charles Walston. New York and London: Charles Scribner's Sons. 1926. lxvii + 171 pp. $2.00.

Barnes, Harry Elmer: History and Social Intelligence. New York: Alfred A. Knopf. 1926. xviii+597 pp.

Chang, W. S.: The Development, Significance, and Some Limitations of Hegel's Ethical Teaching. (Published under the Auspices of the China Society of Arts and Science.) Shanghai: The Commercial Press, Ltd. 1925. x+137 pp.

Lagerborg, Rolf: Platonische Liebe. Leipzig: Felix Meiner. 1926. xi+295 pp. 12.50 R.M.

NOTES AND NEWS

The degree of LL.D. was conferred upon Professor John Henry Muirhead, Emeritus Professor of Philosophy at the University of Birmingham and now Mills Lecturer in Philosophy at the University of California, by the University of California, at its celebration of Charter Day, March 23, 1926. Professor Muirhead has been appointed to serve as Mills Lecturer for a second year, 1926–1927.

In the second and third announcements of the Eighth International Congress of Psychology, to be held at Groningen, Holland, September 6–11, 1926, the names are given as follows of those who have consented to introduce symposia on the subjects selected, and the names of those who will lecture on some special subjects:

Understanding and Explanation: BINSWANGER, Kreuzlingen; SPRANGER, Berlin; ERISMANN, Bonn; EWALD, Erlangen.

Intensity of Sensations: BORING, Cambridge, Mass; MYERS, London; WERNER, Hamburg.

Shape-qualities: BENUSSI, Turin; KOFFKA, Giessen; MICHOTTE, Louvain; RUBIN, Copenhagen; SANDER, Liepsic.

Behaviorism: MCDOUGALL, Cambridge, Mass.; PIÉRON, Le Vésinet.

Psychology of the Primitive Races: BARTLETT, Cambridge; LEVY-BRUHL, Paris; MEYER-GROSS, Heidelberg; STORCH, Tubingen.

Religious Psychology: JANET, Paris; LEUBA, Bryn Mawr; E. JONES, London; THOULESS, Manchester.

Special subjects: MISS BAUMGARTEN, Solothurn; MRS. BÜHLER, Vienna; BÜHLER, Vienna; BUYSE, Louvain; FOUCAULT, Montpellier; JAENSCH, Marburg; JULÁSZ; Budapest; LEY, Brussels; MARBE, Würzburg; PAULHAN, Paris; PETERS, Jena; RIGNANO, Milan; RUPP, Berlin; SELZ, Mannheim; SPEARMAN, London; STERN, Hamburg; THURSTONE, New York; WERNER, Hamburg; ACH, Göttingen; ADLER, Vienna; AVELING, London; ETTLINGER, Münster; GODEFROY, Amsterdam; GRÜNBAUM, Amsterdam; HENNING, Danzig; HERBERTZ, Thun; F. B. HOFMANN, Berlin; JAEDERHOLM, Göteborg; KLEMM, Leipsic; LAHY, Paris; LANGFELD, Princeton; LEWIN, Berlin; LINDE, Göteborg; LIPMANN, Berlin; MINKOWSKI, Paris; O'ROURKE, Washington; PFISTER, Zürich; PFUNGST, Frankfort-on-Main; POPPELREUTER, Bonn; SJÖBRING; Uppsala; WERTHEIMER, Berlin; WIMMER, Copenhagen; WRESCHNER, Zürich; WYNN JONES, Leeds.

Sections about the following subjects will be constituted: *Eidetic imagery, Psycho-galvanic reflex, Higher psychic processes, Animal psychology, Psychopathology,* and *Applied psychology.*